



Waste Minimization: Increased Profits and Productivity PPG Industries

■ 2 Year Return on
Investment

■ \$205K Savings
Annually

■ 320,000 Gallon
Reduction in Incinerated
Wastes

■ Fewer Reporting
Requirements and Less Legal
Liability

Publicity is important, even if
only in internal publications.
Increased awareness serves
as a springboard for more pro-
jects

What is PPG Industries?

The automotive coatings plant of PPG Industries, Inc. (PPG), located in Cleveland, Ohio, manufactures both solvent-based and water-based coatings. Prior to 1992, PPG used thousands of liters of water each week to clean manufacturing equipment and incinerated a large volume of wastewater contaminated with methyl isobutyl ketone, butyl cellosolve, and lead.

What Did They Accomplish?

In 1992, PPG designed and installed a combined ultrafiltration/reverse osmosis (UF/RO) process to recycle wastewater. By combining the two membrane-based technologies, PPG was able to utilize a progressive filtering system that cleaned the wastewater to a level suitable for reuse in equipment cleaning operations. As a result, PPG has cut the volume of hazardous waste requiring incineration from 400,000 gallons per year to 80,000 gallons per year and saves \$205,000 annually.

Environmental Achievements

PPG received a National Industrial Competitiveness through Energy, Environment and

Economics (NICE³) grant from the U.S. Department of Energy (DOE) and worked cooperatively with the State of Ohio to promote the UF/RO cleaning technology. The UF/RO system reduces the volume of waste disposed by about 80%, depending on the level of production. This experience serves as one example of how a successful partnership between government and industry can foster waste reduction.

Another major achievement of this project was the increased awareness of waste minimization that grew throughout the company. This awareness was due in part to the publicity the company received through NICE³. The increased awareness served as a springboard for development and implementation of more projects. PPG has undertaken numerous projects at all of its approximately 15 facilities located in nine countries. The corporation as a whole openly embraces waste minimization as a major goal.

Regulatory Relief

Though PPG's regulatory status has not changed, less waste means fewer opportunities for spills, accidents and violations and therefore fewer legal liabilities.

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The Implementation Process

Design of the UF/RO process was accomplished by an in-house, cross-functional team comprised of environmental managers, production managers, and other staff working with outside consultants who provided expertise on UF/RO.

Because the system was new, three operators received training during one session. From concept to implementation, the process took about eight months.

PPG has not altered the UF/RO system since its inception in 1992. The system has in no way impeded manufacturing or lowered product quality. PPG has measured the success of the process by analyzing reductions in waste using in-house measurement tools.

Economics: Costs and Payback

PPG received funding from DOE and the Ohio Department of Energy. In addition, PPG contributed an initial capital outlay of over \$200,000. Annual operating costs for the unit are estimated at \$175,000.

Annual savings resulting from the project have remained fairly steady at a level of \$205,000, equal to \$380,000 worth of savings in water disposal costs less the \$175,000 in operating costs. The investment paid for itself in just over two years.

Hurdles

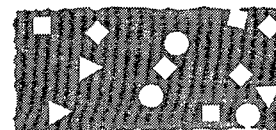
No significant hurdles presented themselves when PPG implemented these measures. A few minor man-

agement and technical issues arose; however they were quickly resolved.

Words to the Wise

PPG is enthusiastic about waste minimization and environmental stewardship, especially considering the positive publicity that came from the UF/RO process.

WASTE MINIMIZATION NATIONAL PLAN



Reducing Toxics in Our Nation's Waste

For more information about the Waste Minimization National Plan, call (800) 424-9346 or check the World Wide Web at <http://www.epa.gov/epaoswer/hazwaste/minimize>.